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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/595,523

04/25/2006

Masahiro Nakayama

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2166

29453

7590

11/05/2010

Judge Patent Associates

Vert Nakanoshima Kita, Suite 503

6-3 Nishitemma 4-Chome, Kita-ku

Osaka-Shi, 530-0047

JAPAN

EXAMINER

LEE, JAE

ART UNIT

PAPER NUMBER

2895

MAIL DATE

DELIVERY MODE

11/05/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/595,523	<b>Applicant(s)</b> NAKAYAMA ET AL.	
	<b>Examiner</b> JAE LEE	<b>Art Unit</b> 2895	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,2,11 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,11,12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/23/2009 has been entered.

### ***Response to Arguments***

2. Applicant's arguments with respect to claims 1, 2, 11, and 12 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1, 2, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Motoki et al. (USP# 6,468,347 B1, hereinafter Motoki) and further in view of Kiehlbauch et al. (Pub No. US 2004/0238487 A1, hereinafter Kiehlbauch).

With regards to claim 1, Motoki teaches a gallium-nitride semiconductor substrate having a mirrorlike, planar surface directly onto which a light-emitting-device-forming film has been epitaxially grown (see Fig. 21a-Fig. 21e).

Motoki, however, does not teach the gallium-nitride substrate therein contaminated at the interface between the mirrorlike, planar surface and the device-forming film grown thereon by one or more elements selected from Si, Cr, Mn, Fe, Ni, Cu, Zn and Al at a density level of from  $15 \times 10^{10}$  to  $10 \times 10^{11}$  atoms/cm<sup>2</sup>.

In the same field of endeavor, Kiehlbauch teaches how in a ordinary CMP / polishing method, one of ordinary skill would expect to find metal contaminants such as

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Fe for example whereby the contamination level of Fe is approximately  $15 \times 10^{10}$  atoms/cm<sup>2</sup>.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to utilize the method of Kiehlbauch to produce surface contamination between the claimed ranges. Such ranges reflect an improved surface with minimal metal contamination and therefore produce a device with better properties.

With regards to claim 2, Motoki teaches a gallium-nitride semiconductor substrate having a mirrorlike, planar surface directly onto which a light-emitting-device-forming film has been epitaxially grown (see Fig. 21a-Fig. 21e).

Motoki, however, does not teach the gallium-nitride substrate therein contaminated at the interface between the mirrorlike, planar surface and the device-forming film grown thereon by one or more elements selected from Si, Cr, Mn, Fe, Ni, Cu, Zn and Al at a density level of from  $15 \times 10^{10}$  to  $5 \times 10^{11}$  atoms/cm<sup>2</sup>.

In the same field of endeavor, Kiehlbauch teaches how in a ordinary CMP / polishing method, one of ordinary skill would expect to find metal contaminants such as Fe for example whereby the contamination level of Fe is approximately a little above  $15 \times 10^{10}$  atoms/cm<sup>2</sup>.

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to utilize the method of Kiehlbauch to produce surface contamination between the claimed ranges. Such ranges reflect an improved

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surface with minimal metal contamination and therefore produce a device with better properties.

With regards to claims 11 and 12, Motoki teaches a gallium-nitride semiconductor substrate as set forth in claims 1 and 2, wherein the substrate surface on which the device-forming epitaxial film has been grown is a complex of faces in which Ga is exposed, and faces in which N is exposed (the gallium nitride substrate taught by Motoki will have exposed faces of gallium atoms and nitrogen atoms when the structure of gallium nitride is viewed at the atomic level).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAE LEE whose telephone number is (571)270-1224. The examiner can normally be reached on Monday - Friday, 7:30 a.m. - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Richards can be reached on 571-272-1736. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jae Lee/  
Examiner, Art Unit 2895

JML

/N. Drew Richards/  
Supervisory Patent Examiner, Art Unit 2895